Scenarios

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which seem to be sufficiently firm to indicate underlying driving forces. The hard part is keeping it simple. And as we have seen, the more complex and uncertain the problem, the simpler the causal models that prove most useful.

SCENARIO STRUCTURING

So far the scenario team has collected the basic data from which the new scenarios will be constructed, and structure has been put into these by clustering and categorising and by a search for trends and underlying causal structure. The next step is to create a limited number of scenarios in which the insights gained can be reflected. As we discussed in Part Two, storylines are an efficient medium through which ideas across many disciplines can be linked in context. The process we have described so far has ensured that the totality of the data available at this stage is highly relevant to the client and also contains an appropriate level of novelty. The purpose of the next step is to develop a number of internally consistent storylines, which project as much as possible of the learning obtained in the project so far. There are a number of ways in which this can be achieved, which we will subdivide into inductive, deductive and incremental methods. In the inductive method the approach builds step by step on the data available and allows the structure of the scenarios to emerge by itself. The overall framework is not imposed, the storylines grow out of the step-by-step combining of the data. In the deductive method the analyst attempts to infer an overall framework to start with, after which pieces of data are fitted into the framework, wherever they fit most naturally. The difference between the inductive and deductive methods is between letting the framework emerge in the process of building stories from the data upwards, or deducing a framework from the data as a first step.

A third way of developing scenarios is called the incremental method. This approach aims lower and is useful if the client team still needs to be convinced that the scenario approach offers an opportunity to generally enhance the strategic conversation. In situations where scenario-based planning is not yet embedded in the thinking style of the organisation the client team may still be strongly attached to an "official future", a shared forecast that is implicitly the basis of all thinking about strategy. For such a client the first steps on a scenario-based planning road are facilitated by using the official Business-As-Usual future as the starting point, from which the scenarios make excursions into surrounding territory, related to issues defined by the client.

The degree to which the three methods produce similar or different scenarios depends on the clarity with which the team has come to see the main uncertainty bifurcations in the future. If there are only a few major overwhelming uncertainties the three approaches tend to produce similar results. Pierre Wack put it like this: "Good scenarios emerge from an intensely experienced polarity." If the team does not have this clear understanding of the main uncertainties facing the client it may be advisable to spend more time discussing the findings and the underlying structure to try to develop a better insight in the crucial driving forces in the future.

Inductive Scenario Structuring

Induction is a process of reasoning by which a general conclusion is drawn from experience or experimental evidence. Reasoning from the specific to the general. The inductive method has been called that because it is based on scenario building from experiential building blocks to scenarios, from the more particular to the more general.

Inductive scenario structuring can be done at the level of events or at the level of structure. Event structuring starts with team members turning the understanding and new insights gained by the scenario team into illustrative events which are recorded on an event card, with annotations for possible timing and actors involved (see Quinn & Mason 1994). Cards also show clearly whether the event is seen as predetermined or as one pole of an uncertainty (scoping outcome, see page 227). Predetermined events need to end up in all scenarios, while uncertain events are included in only one. If events contain predetermined elements as well as uncertainties this is reflected by representing them in multiple event cards. For example, if it is considered predetermined that OPEC will set a production ceiling, but it is uncertain at what level that will be, then more than one card is generated, for example one with the ceiling set at 30 million barrels per day and one at 25 million barrels per day. The team then needs to make sure that one of these cards is part of each scenario.

The next step is for the team to start building scenarios from the events generated by putting them in time order. Some cards are bound to form a natural cluster while others seem unconnected. In that case the team will start different scenarios, so that both can be accommodated. The jigsaw puzzle is finished only when all cards have found a natural place in one of three or four scenarios. The team invents new events and generates new event cards while it is allocating events to scenarios in order to create connections and complete the overall logic. This is

necessary to ensure that the final scenarios all meet the requirement of internal consistency, i.e. events should causally follow from each other. The team will test this by drawing causal arrows between event cards on the display board. In this process the events come first, the logic follows from putting them in time order, and implying causal relationship. After a number of iterations this tends to produce satisfactory scenarios that reflect team learning during the earlier scenario process. When the team members are satisfied that no further progress can be made the scenarios are named and an overall framework is inferred from the storylines as generated. This is often easier said than done. A problem with the inductive method is that the scenarios that emerge rarely have a clear or elegant relationship to one another as they come out. Identifying the overall framework normally requires a lot of additional thinking and reshuffling. Early on it is not easy to tell the weeds from the useful plants. It takes strong facilitation, and a group that is patient enough to deal with the ambiguity and uncertainty of not knowing how to distinguish the weeds from the plants until the very end of the exercise.

The inductive method can be applied at the level of logic. In this approach understanding gained during the preparatory phase is expressed in bits of logical relationship. The vehicle used is a short part of a story, connecting up a few events through a cause-and-effect relationship. These logic fragments have become known as "snippets". They are often generated by interpreting influence diagrams developed by the team.

A typical snippet might indicate that increasing inflation affects the level of business confidence, which in turn affects the level of investments. Or a level of cash generation beyond absorptive requirements would lead oil producers to reduce production levels, which would increase the price. Or prosperity accelerates change, especially in real estate. If the current boom continues another decade, it will put enormous pressure on building turnover. The activity of generating snippets usefully alternates with alternative expression of the situation in influence diagrams, in an iterative process. This type of approach requires sufficient time to be spent on the prior analysis of data, and the articulation of driving forces.

Once diminishing returns are reached in this the snippets developed are written on cards. The next step is for the scenario team to allocate these cards to three or four piles, on the basis of intuitive clustering. Once this has been achieved each of the piles is sorted and turned into an overall story logic. This is achieved in the same way as in the event method, by implying a time dimension and sorting the cards accordingly. In the process of doing so new events or snippets are generated to make the story hang together better. For example, someone might suggest

linking the OPEC with the inflation snippets. If demand goes down then production goes down, cash generation falls below requirements, and the pressure is on to produce. This has the interesting effect of lowering prices, reducing cash generation further. In the longer term lower energy cost will lead to reduced inflation, and recovery in the consuming countries. In this way snippets are chained together into storylines. The approach differs from the event-driven process, in this case causal logic generates events, rather than the other way around.

While the inductive method is capable of producing powerful scenarios the team needs to be on guard for the in-built danger that the scenarios end up in a "good/bad mode". There seems to be a natural tendency for developments considered favourable for the client to cluster in one scenario and the unfavourable events in another. This is highly undesirable and significantly reduces the value of the scenario exercise. A basic tenet of the scenario-based planning methodology is that all scenarios are equally plausible. The best set of scenarios contains only futures that the client will find worth preparing for. If some scenarios are experienced as too unpalatable for the client to contemplate, or too rosy to be credible, the team needs to make another iteration with this requirement in mind. As a general rule the team should avoid thinking in terms of good or bad futures, see page 128. Only plausibility and internal consistency should be the yardstick for an effective outcome.

Following is an example of inductive scenario construction. In it Adam Kahane describes a project with a group of political leaders in South Africa (Kahane 1992b).

> Some South African political leaders had been struggling to find a common language with which they could talk about the future. In *1991*, an economist at the University of the Western Cape named Pieter le Roux wondered if scenarios would help, and he invited me to facilitate a project. Scenarios were well-known in South Africa because during the *1980s* a scenario exercise led by Clem Sunter, a senior executive at the Anglo-American Mining Corporation, with important help from Pierre Wack, had played an influential role in building public discussion about the future of the country. This project would be different. The scenario team was to include 22 members from across the spectrum of South Africa's diverse constituencies. The multi-racial group included left-wing political activists, officials of the African National Congress, trade unionists, mainstream economists, and senior corporate executives. Our purpose was to investigate, and hopefully develop, common mental models about the future of the country. When we started, many people in the group were pessimistic; they expected to spend the meetings in endless dispute, unable to agree on anything.

Because of the charged political atmosphere, a "visioning" exercise might not have worked here. In fact, at the first meeting I said, "We're not going to discuss what you would like to happen. We're going to discuss what might happen." This turned out to be a liberating choice of words. If I had asked what future they wanted, each participant would have pulled out their party platform. In the end, the process did produce a scenario they all preferred, but they would never have got there if we had started by looking for it. Instead, we were looking for a common understanding.

We started with an exercise that made people realise that they couldn't predict what would happen. Dividing them into sub-groups, we asked them to come up with stories of what might happen to South Africa, seen from the vantage point of 20 years in the future. When we reconvened in plenary, we had 30 scenarios to consider. During the presentations, no one was allowed to say, "That's a stupid story," or, "You shouldn't be saying that." I allowed only two types of interruptions: "Why does that happen?" and "What happens next?" If the presenter couldn't answer those questions then they had to sit down; the story was no good.

It turns out that this is a great exercise. People came up with all kinds of wild stories, including stories inimical to their own interests. For example, one left-wing sub-group proposed a story called "Growth through repression," suggesting that South Africa might have a tough authoritarian left-wing government. Another story suggested that the Chinese government would provide arms and support for a Communist liberation movement, which would overthrow the government. I don't know whether it was originally proposed seriously, but when people asked, "Why does that happen?" there was no way to substantiate it. So it fell by the wayside.

The rest of the whole exercise was a narrowing process – pruning our scenarios from 30 down to three or four "useful" stories. To be useful, they had to be logically consistent and plausible, which are difficult criteria to meet. But the discussion of plausibility and consistency was very good for this politically charged, diverse group.

Then we asked, "Which of these stories are useful to tell to an audience?" In other words, what did participants believe our audience needed to think about? In our plenary group, after much discussion, we narrowed our selection down to four distinct stories, all focused on the nature of the political transition (perhaps the most important single uncertainty in the country), and all named after winged creatures.

The first was called "Ostrich". The De Klerk government "sticks its head in the sand". Some path other than a free election occurs.

White segregationists gain in influence, as do extremist black groups; they stop communicating, and polarise the country. "Eventually, the various parties are probably forced back to the negotiation table," said the group's report, " but under worse social, political, and economic conditions than before." This doesn't work very well: it might lead, for instance, to civil war.

The second scenario, called "Lame Duck", envisaged a prolonged transition with a constitutionally weakened transitional government. Because the government "purports to respond to all, but satisfies none", investors hold back, and growth and development languish amidst the mood of long, slow uncertainty. This was an important scenario because many people expected a coalition government to form, and now they could see the potential dangers.

The third, called "Icarus," ended up being the most influential. Originally proposed by some of the black left-wing members of the team, it suggested that a black government would come to power on a wave of public support and try to satisfy all the promises it made during the campaign. It would embark on a huge, unsustainable public spending programme, and consequently crash the economy. For government and business observers, the existence of the Icarus scenario was a reassuring phenomenon, as it influenced the policy debate on the left. For the first time, a team, which included prominent left-wing economists, discussed the possibility of government trying to do too much. This was hopeful, because only by discussing a potential catastrophe can you prevent it.

"Flamingos" was the most positive of the four. Like Lame Duck, it concerned a coalition government, but this was a good coalition. The name was chosen because flamingos rise slowly, but fly together. In this scenario the economy gets no kick-start. There is a long, gradual, and – most importantly – participatory improvement, with all the diverse groups in the country "flying together". Because the scenario process keeps asking what would have to happen for each future to take place, the group emerged with a sense that this optimistic future, in which economic growth and political equality reinforced each other, was possible.

By the standards of Shell, these were not very deep scenarios; they had little research or quantification behind them. But their significance came from the fact that they were arrived at collaboratively by a very broad group. All members of the team endorsed all of them – not as desired futures, but as valid mental models for how the future might unfold. When they presented the scenarios to other groups and forums, they all stuck exactly to the basic points, even in cases where they disagreed with the formulation.

This has made the presentation of the scenarios enormously effective. When the scenarios were presented to an ANC audience, for instance (nearly always by presenters who include an ANC-affiliated member of the team), it provided a non threatening way to bring up the unpalatable message of "Icarus" – that a crash public-spending programme might not work. The Lame Duck scenario gave the National Party audiences a way to confront the dangers in their inclination to encumber the transition process with safeguards, and the Ostrich had a similar message for the conservatives.

When the team came together, they had no common view on the difficulties of transition. By arguing over the distinctions between Lame Duck and Flamingos, what distinguished Lame Duck from Flamingos, they came to a common view, on a moderately detailed level, about some of the problems around limiting the power of the transitional government. I'm sure that very few of them, before the meeting, had considered the question of macro-economic constraints on a newly elected government. Now, through the Icarus scenario, they were deeply familiar with it.

You may wonder what keeps people, in these highly charged meetings, from walking out. Conservatives and radicals kept coming back because they felt they were learning a great deal – and enjoying themselves. The advantage of scenarios is that, unlike in a negotiation, people don't have to commit their constituents, but they can see a common language – a common way of understanding the world – emerging fairly early in the process. Once the scenario process is over, that common language should make subsequent negotiations easier to conclude successfully.

This exercise shows the potential of scenarios as a foundation for collaborative action, especially among people who are enmeshed in conflict. As writer Betty Sue Flowers puts it, "In a scenario team, you develop two or three different pairs of glasses to see the world through. You can put them on and off, and by doing that, it gets easier for you to see the fourth and fifth way."

Deductive Scenario Structuring

Deduction is a process of reasoning by which a specific conclusion logically and necessarily follows from a set of general premises. Reasoning from the general to the specific. The deductive method has been called that because it is based on scenario building from a general framework to specific scenarios, from the more general to the more particular.

The deductive method aims first to discover an overall structure in the data, to be used as a framework for deciding the set of scenarios to be developed, rather than let the scenarios emerge step by step, building up from the data as in the inductive methods. The deductive framework specifies the scenarios in the set in terms of scoping outcomes of a few (two or three) critical uncertainties, selected as scenario dimensions. These specifications are sometimes called "end-states" (states-of-affairs in the horizon year, described in terms of the scenario dimensions). Having established the basic nature of each scenario in this way they are then filled in from the data available, supplemented with new data as required. Trying to name the scenarios at this stage with one or a few words expressing the basic nature of the storyline is an effective way to test that the team has reached consensus on what this basic structure is.

The framework is developed by study and manipulation of the data in a few stages:

- Grouping of data in a hierarchical structure.
- Identification of high-level mutually independent dimensions at the event, trend or structural level.
- Ranking these on the basis of predictability and impact on the client.
- Selection of the most important as structuring dimensions.

The process starts with grouping the data hierarchically, in a similar way as the interview data are processed (see interview analysis, page 183). Each insight gained during the research period is summarised in a few words on cards or Post-its. The next step is clustering of these notes. The process alternates intuitive clustering with testing of clusters on mutual independence and internal consistency, iterating until every insight has found a natural place in the context of all other notes.

From this point onwards the structuring process can be conducted on the basis of events, trends or structure. Most scenario teams will want to try all three approaches to see which one produces the most insightful framework.

If the event approach is followed the team now needs to decide on a limited number of key events which will have overriding influence on the future. It is often helpful to express these in an event tree, if decisions logically follow from each other. An example is the Mont Fleur scenarios discussed above, where the group agreed that three events seemed to be of overriding importance:

- Will a power-sharing agreement be reached between the parties?
- Will the transition of power take place quickly or will the process of transition get bogged down?

- Will the new government follow sound economic policies, or will it be more populist?

As shown in Figure 29 the resulting four scenarios can be structured in an "event tree":

- If no agreement were reached the "Ostrich" scenario would unfold.
- If the transition got bogged down the scenario was called "Lame Duck".
- If the policies were populist the "Icarus" scenario showed quick development followed by collapse.
- If all these hurdles could be taken the future would develop in the "Flight of the Flamingos" scenario.

In this way a coherent scenario framework can be derived from key events, depending on how these play out one way or the other.

However, it may not always be possible to find a limited number of key events, which have such overriding influence on the future. In that case the team may wish to look somewhat deeper in the "iceberg" for key trends. If the structured data show a few key trends which may compete for dominance in the future the scenario framework may be based on these.

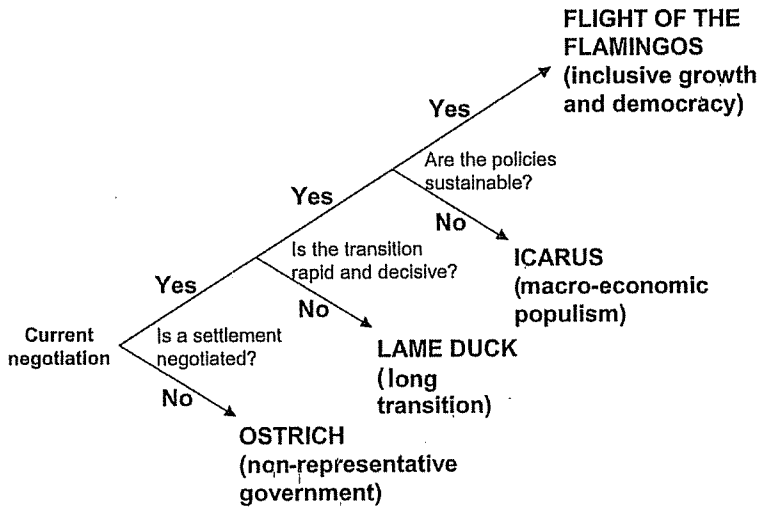

Figure 29. *The "Mont Fleur" scenario structure*

An example of this approach is the 1989 Shell scenario set (Kahane 1992b). Having clustered the data as discussed above the team concluded that developments seemed to fall into two natural clusters, centred on economy and ecology. Analysis seemed to indicate that developments in both of these areas could hit serious constraints, which would have major repercussions on the way the future would play out.

- Parts of the new global economy were clearly developing outside the control of the traditional national control mechanisms; as a consequence overheating could develop out of control, and the world might end up in a depression, following a collapse in confidence.
- On the other hand society was becoming more and more aware of ecological limits, and this might lead to priority being given to restructuring activity, with the possible effect of diverting the economic crisis.

The team concluded that if the ecological awareness trend dominated, attention would move to restructuring of global governance systems, creating significant new investment levels, and leading to the economic confidence being maintained, or restored. But if the economic system hits its limits first, a serious recession would push ecological considerations to the background. One of these trends would come to dominate the other. As a consequence a framework results (see Figure 30) in which two scenarios are indicated, depending on which trend dominates perception in society. The dominant trend would create the scenario driving force, pushing the other into the background to become relatively insignificant.

The third deductive approach is based on identifying two or three key structural variables or driving forces, on the basis of which the scenarios will be distinguished from each other. Expressing each of these driving forces in terms of their dual scoping outcomes will then create a 2×2 (or $2 \times 2 \times 2$ in the case of three driving forces) matrix, indicating four (or eight) scenario end-states as candidates for the scenario set. This approach is only practical if two or three overwhelming driving forces can be identified, as with any more the number of candidate scenarios multiplies exponentially. This means that the team needs to delve deeply into the structural "iceberg" of the data to define those elements that really matter for the future in terms of only two or three driving forces. One of the first examples of this approach was developed by Wack (Wack 1985a) for the French energy business in 1965, where every future uncertainty seemed to be dominated by the two crucial dimensions:

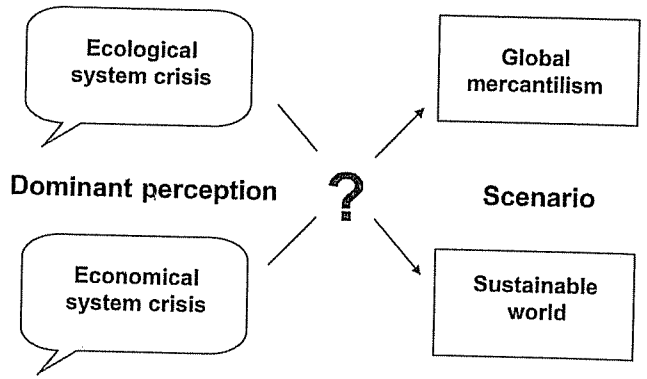

Figure 30. *Scenario structure, based on dominant trends*

- The future of the government regime vis-à-vis the industry ("dirigiste" or "laissez-faire")
- The possibility that nationally significant indigenous natural gas reserves would be found (since then answered in the negative).

The 2 × 2 matrix is shown in Figure 31.

In another example the environmental factors of "outsourcing" and "flattening of organisations" were causally combined with "scale" to define one dimension with the following scoping outcomes:

- On one end: "dominance of markets by a few global players who directly or indirectly control all smaller companies".
- On the other end: "myriads of small companies stealing away the business from slowly fading giants".

A second dimension combined systemically the factors "economic inequality", "social unrest", and "consumer tastes". This resulted at one end in "a harmonious global segmentation of consumers" and on the other "a violent regional particularisation".

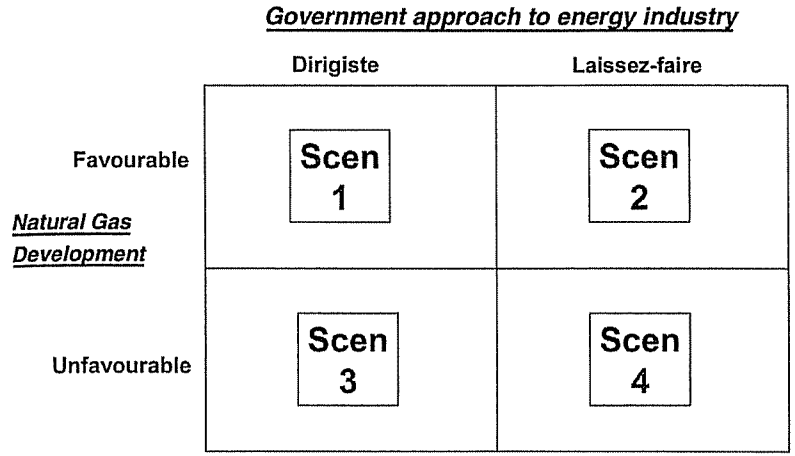

Figure 31. *Example of a scenario matrix*

The Matrix Approach

Most scenario projects use this "Matrix Approach". It is particularly appropriate in situations of considerable uncertainty, where a few dimensions delineate much of what we know about the situation in the future. This is due to the way that orthogonal uncertainties "add up" (see page 93). We have called these Critical Uncertainties the Scenario Dimensions (see page 227). These are selected on their effectiveness in specifying scoping outcomes that are significantly spread out and different from each other. The scenarios then tell the stories of how the world moved on from history and the current reality to arrive at these very different situations as specified in terms of the scoping outcomes of the scenario dimensions in the horizon year.

Clients find it very useful to see and understand the scenarios in a logical relationship that the matrix provides. But this is not its main purpose. The method ensures that we end up with three or four stories that are as different from each other as possible within the limits of credibility to the scenario user. As a result it makes clients explore more of their business environment space than they would otherwise do. Expanding mental models can only be done within the limits of plausibility. Recall that plausibility is different from probability, it is a subjective notion in one's head, not a mathematical piece of datum. It is based on causality, not on frequency. If a good causal story can be told on how we got there the outcome will be plausible. The matrix method is designed to *maximise the spread of the scenarios in the set within this plausible*

space. The team is challenged to think widely, and to produce storylines, with a beginning, a middle and an end, which in its dynamics illustrate the plausible workings and structural inter-relationships of the driving forces.

To maximise scenario spread within the plausible space the choice of the critical uncertainties is made on the basis of their potential impact on the client's situation as well as their relative level of uncertainty. If a dominant driving force is predetermined it cannot be used to distinguish the scenarios in the set. The greater the range of scoping outcomes of a critical uncertainty the more useful it is in a scenario framework.

The natural choice for scenario dimensions are driving forces with high impact and high uncertainty (i.e. large range of possible impact).

Therefore discussion on which variables should be used as scenario dimensions takes account of both impact and level of uncertainty (range of scoping outcomes), and we are looking for those with most impact and least predictability. A useful way to structure this part of the discussion is by using an impact/predictability chart, in which potential candidate dimensions are positioned depending on how the team ranks these on the two characteristics of impact and predictability. The chart is a simple rectangular space running from less impact at the left to more impact on the right, and less predictable in the bottom to more predictable in the top. As we are looking at relative notions here (everything is important, but some things have more impact than others, everything is unpredictable, but some things are more predictable than others) the items should be placed using all space available. For an example see Figure 32. The scenario dimensions we are looking for have to be found in the more impact/less predictable corner.

Before we go on we need to be a little clearer on what is meant here by predictability. On page 229 ("First Data Analysis") we discussed the problem of predicting a possible strike occurring. Recall that the strike as such was highly predictable, but the uncertainty was in when it might happen. This meant that the critical uncertainty is not the strike as such but something like "the speed with which unrest escalates". So do we rank this high or low on the predictability scale? One has to be precise on the question "predictability of what?" Ranking means that we need to be able to bring, if only conceptually, the different candidates back to one common denominator. As we are trying to maximise the range of scenario outcomes the common denominator should be *the potential impact of the critical uncertainty on the client.*

The assessment of the degree of predictability is greatly helped by the specification of scoping outcomes. So in the example one would consider the situation for the client if the strike is tomorrow, compared to the situation that it happens in three years' time. The conclusion may

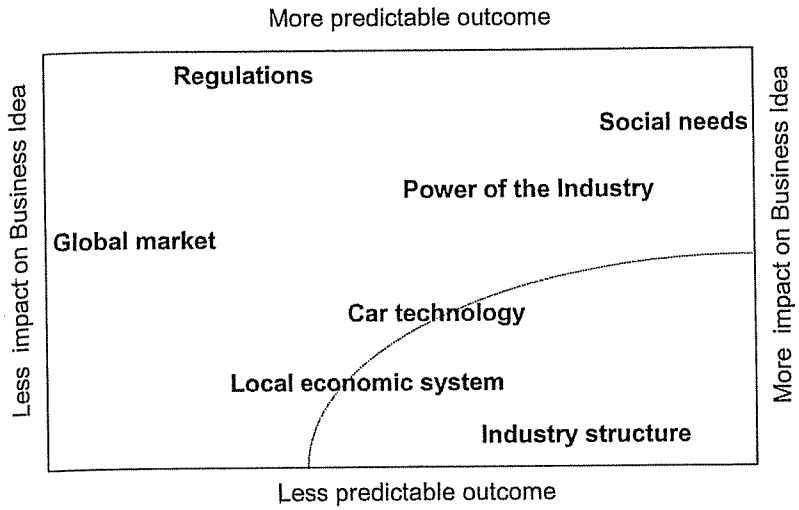

Figure 32. *Driving force ranking space*

be that while the impact is significant there is not much difference in terms of the damage done one way or the other, predictability as used here should be scored high. Or you may find that a strike in three years' time is much less serious, e.g. due to new automation in the industry by that time, while a strike tomorrow could bankrupt the company. In that case there is high unpredictability, and this variable becomes a candidate for being a scenario dimension.

Having selected the two most critical uncertainties in this way these are now further specified by working out the scoping outcomes in the horizon year for each one in some more detail. Recall that the scoping outcomes have to be chosen such that they are illustrative of the range of uncertainty in the scenario dimension. These can then be combined in a 2×2 matrix as illustrated in Figure 31. This is called the scenario matrix, specifying the essential differences between a set of four scenarios.

The resulting four corners of the scenario matrix pose four questions to the scenario team. In each corner two scoping outcomes of different dimensions are combined to specify a future world. This leads to the four most important questions to ask, e.g. what kind of world would it be in which we have to contend with both high taxes and a fragmented industry structure? Or what sort of conditions could lead to a drop in the price of oil in a recessionary world. It is important for the team to work out these questions in detail to ensure that the understanding is shared. For example, the team can jointly write into each of the four corners a

list of keywords that characterise the four worlds. The scenarios in each corner then become the response of the team to these four questions.

The next step is for the scenario team to fill in the detail in each scenario, and to create a story of how the end-state is reached from the current state of affairs, through a series of events, with one event leading to another over time. A storyline over time needs to be developed based on cause-and-effect logic. One way to achieve this is by translating research data into illustrative events, and to record these on event cards, as discussed above under the inductive method. A practical way of developing event cards is by using the scoping outcomes developed earlier during the first data analysis (see page 228). In the deductive method the basic scenario structure has already been decided, and event cards are allocated to one of the four scenarios where they fit most naturally.

A helpful feature of the matrix approach is that the team can now be broken up in subteams each developing one scenario. The matrix makes clear up front the type of future each subteam addresses and what should be left to the other teams. It helps them to focus more. The subteams arrange the cards in time order, to create the storyline, filling in new detail wherever this is helpful to create a satisfactory story.

The more successful the team is in identifying truly *orthogonal scenario dimensions* the better the resulting scenario framework can encapsulate the findings from the scenario research process. This will allow the team to better explain their findings and show new ways in which history and present developments can be interpreted. This will help the client to get on top of the business environment through reframing of traditional mental models, and to test, and if necessary challenge, strategic plans for the future.

The way scenarios are developed deductively, through the selection of key scenario dimensions, helps in avoiding scenarios in the "good/bad mode", but it can still happen. Therefore the same test needs to be made as suggested for the inductive approach. If it is found that the scenarios call up very different value judgements (positive or negative) in the client group it is worthwhile making another iteration with this criterion in mind. All scenarios should reflect worlds in which the client would want to live and to prepare for.

A word of warning. An illusion that the matrix fosters is completeness. "We filled all four corners. We've boxed the future." But the biggest unknowns are those uncertainties the team hasn't even considered, those that are not on the mental map of the group building the scenarios, the uncertainties we have called the unknowables. Unexpected events will happen. This is why organisations need to think about an ongoing action-learning approach to scenarios, instead of one episodic scenario

building project. This is where monitoring/early warning systems and iteration become important, and where the organisation engages with its environment on an ongoing basis, and slowly but surely starts noticing the "differences that matter".

The Incremental Method

In situations where scenario-based planning is well established the deductive and inductive methods are the preferred approaches. They offer the best opportunities for generating new thinking as a contribution to the strategic conversation. However, not all client teams are ready for this type of approach. For example, in a situation where scenario-based planning is just being introduced the client team may still have to be convinced that it offers an improvement over the traditional forecasting method, and that it is cost effective. Very often interest in the scenario approach will have been created by means of a "challenge scenario" (see page 270), but there may still be a strong attachment to the shared Business-As-Usual forecast of the business, the "official future". A lot of time will often have been invested in this and once it has been accepted as the agreed plan, people who want to open this up again are not always welcome. This is the world of management as described by Lindblom (page 31) where decision making is a negotiative business, and where people are expected to stick to an agreement. Mavericks are not welcome here.

The scenario team needs to tread very carefully here, if they want to avoid being rejected altogether. In such a case the incremental method may be indicated. This takes the official future as the starting point. The team first tries to identify the major issues and threats that people are concerned about in relation to the official future. Typically these are threats or bottlenecks or, sometimes, looming opportunities that define, by themselves, the logic of a scenario. They then build the scenarios around these, one scenario per issue. The incremental method is sometimes called the "threat approach". Finding flaws in the official future does not normally prove too difficult, as forecasting methods do not force analysts into in-depth analysis of driving forces. Extrapolation will always lead to obvious inconsistencies if it is stretched out far enough into the future (see below under "Phantom Scenarios").

Superficially what the scenario planners are doing may look to the clients as what they will know as "sensitivity testing". However, the scenario planners will make sure that there is a fundamental difference, namely that alternatives will not be conceived as variations in a single

business variable, but as variations in underlying driving forces, and that each scenario will be conceived as an internally consistent story on that basis.

The first step in this approach is for the scenario team to analyse carefully the official future scenario. Specifically the team needs to establish the degree to which this can be considered as internally consistent. This requires two specific analytical jobs:

- Trend analysis. In this step the analyst tries to identify trends that can, in the long run, undermine the structure on which the forecast is based, because of the existence of a breaking point or threshold in that trend. They can be surfaced by considering similar events in the past and/or by extrapolating trends, implied in the official future, further out, until they clearly hit such fracture lines.
- Actor logic. In this step the most important stakeholders in the official future are identified, and the forecast is analysed from the perspective of each of these. The question here is whether the forecast is consistent with the logics of the actors in the game.

If the official future violates the requirement of internal consistency in either of these categories, the first alternative scenario will be an adjustment to the official future addressing this problem.

The team then ranks the major issues and threats that are of concern to the client and selects a few that are of strategic importance. For each of these a driving forces analysis is carried out as discussed above under the deductive method. Having identified the structural relationships between these the scenarios then are designed as illustrations of how this structure could drive futures that are different from the official future. The challenge is to surface the logics that point to or may even define the nature of the issues identified. For example, a strategic issue could be triggered by market vs. regulatory logic in which the issue for the company would be market competition on the one hand and political manipulation on the other.

It needs to be remembered that all this remains very much "thinking within the box" and will not lead to any fundamentally new insights. Everything starts from the existing Business-As-Usual mental model and already existing concerns about strategic issues. The incremental method will structure thinking and make the situation mentally more manageable, but scanning the horizon for entirely new developments and opportunities will require the outside-in thinking of one of the other approaches.

Selecting an Appropriate Method

Which approach is appropriate in which situation? In addition to personal style of the facilitator, and time available for the project, diversity of thinking and tolerance for ambiguity in the client group seem to be important. But the ultimate criterion is the purpose of the exercise.

The value of the deductive method, and the matrix approach in particular, is that it has the potential to jog the team's intuition in a way that leads them into scenario territory that they would not otherwise visit. The inductive approach does not do that to the same extent, it allows the team to stay within the comfort of taking one step at a time. The deductive method is more challenging, as it is designed to push the scenarios out towards the edge of the plausible region. This is important because it is there that the group discovers what they don't know yet, where they articulate the questions they are struggling with and become specific on what needs to be researched. If the purpose of the project is to learn more about the situation this is the way to go.

The deductive method is the most analytical, it offers the best opportunity to explore widely in areas where the thinking would not otherwise penetrate, and it has a strong outside-in emphasis. In situations of strong groupthink where thinking outside the box is an important objective of the project the deductive method is indicated. If the client group thinks cohesively, and has difficulty in widening thinking, its more regimented nature helps to force the thinking into new areas.

This makes it suitable for "sense-making" projects. Deductive scenario building, incorporated in an iterative learning process, can potentially make major contributions in long-standing intractable problems. Its unique feature is its combination of (1) integrative analysis across multiple disciplines that scenarios bring, with (2) in-depth research within individual disciplines where the world has stored most of its knowledge.

The deductive method has the potential of leading to new entrepreneurial inventions if it is built into a wider iterative learning process where scenario building alternates with in-depth research into the questions raised in the scenario building. As we discussed earlier there is no successful strategy without original inventions. If the purpose of the scenario project is to develop new strategy this is the approach worth considering.

It also offers a more codified step-by-step approach than the inductive method. If time is at a premium and it becomes necessary for the facilitator to force the pace it has distinct advantages.

On the other hand, if the emphasis is on conversation, exchanging views and building accommodation and consensus the inductive

approach is more productive. It is more engaging than the deductive method, when people often find themselves drumming their fingers during the "driving forces" discussion. Up to the moment of excitement when the analysis leads to a new understanding of critical uncertainties the conversation often feels vague, promiscuous, and "so what". Not so in the inductive approach.

A divergent client group, or a group with a high degree of tolerance for ambiguity, often does well with the inductive approach. The method exploits the diversity in the group to the maximum, and enriches the scenarios by providing scope for a wide range of views to be incorporated. Groups that have difficulties compromising and coming to joint conclusions often do well with the inductive method. However, the method, if done well, cannot be forced, and suffers under time restraints.

If the purpose of the scenario project is mainly processual, related to group dynamics and behaviour, the inductive method is indicated. It is engaging and motivating and it brings people's thinking together. On the other hand it does not have a clear-cut end-point or end-product. It can go on for ever.

The incremental method is indicated if the client still needs to be convinced of the worth of the scenario method. In such a case the deductive method may seem daunting and the inductive method too ill-defined. Often a client team has over time developed a shared understanding of the environment, embedded in an official future, and feels an intuitive reluctance to open this up for scrutiny. In this situation the thinking process needs time to evolve. The scenario project becomes a first step in a learning process in which the client team discovers the value of outside-in thinking. In such a case the incremental method is indicated.

Therefore the selection depends on the purpose of the scenario project. If the purpose is analytical, such as making sense of a puzzling situation or developing a new original insight, the deductive method is indicated. If the purpose is associated with people, conversation, engagement, team building, consensus building, the inductive method is superior.

In many cases facilitators use more than one approach. Often client teams started off on the incremental or inductive methods run into time constraints, and switch to the deductive method to finish the job. Or teams working through the incremental or deductive methods may halfway decide to take stock of the range of thinking in the team by doing an inductive scenario exercise. Switching of methodology during the project can enrich the process, and should be considered an option by the facilitator at all times.

An Example, Inductive and Deductive Methods Compared

Interestingly the two methods often lead to the same or similar scenarios. This may be indicative of a strong inherent structure in the situation imposing itself on the thinking of the team. This is illustrated in the following example.

Some time ago a group of senior Canadian public servants and private-sector executives got together to discuss the issue of how to organise and govern successfully in a world of rapid change and increasing interconnection. They decided to adopt the scenario methodology to structure their conversation. After inviting a number of interesting people to discuss the theme with them, they met for a workshop for the purpose of structuring their findings in a few scenarios. The following description is an excerpt from Steve Rosell's account (Rosell 1995).

> After an initial introduction an essentially inductive process was adopted to develop a set of scenarios for how the information society might shape the environment for governance over the coming decade. Prior to the workshop, we had worked in smaller groups to identify some of the major certainties and uncertainties in how the environment for governance might evolve. Early in the workshop we reviewed the reports of the small groups and synthesised these.
>
> Then, working individually, we were asked to write snippets, short causal sequences describing how several of those key elements might develop. An example of a snippet: education focuses on information technology skills → surge of young people entering information industries → Canada becomes key player in software. We were encouraged to write the snippets in telegram style. The next step was to break into 3 small groups, which worked to combine the snippets that their members had produced into several longer story-lines. Those were given a name and presented to the plenary session.
>
> We then worked together, in plenary, to organise these bits of story-lines into an initial set of scenarios. Each of the snippets was written on a yellow adhesive Post-it note. The story-lines were constructed by stringing together sequences of these notes. As the story-lines were presented in plenary and then developed into first-cut scenarios the walls of the meeting room soon became covered with large and lengthening streamers, snippets becoming story-lines, becoming scenarios. In that plenary discussion a generally positive scenario began to be developed, built around such story ideas as a

wired world, a new economy and the global teenager, along with a largely negative scenario based on unemployment, social unrest and disintegration. There was also a generally positive middle-range scenario that started to emerge around a combination of reconstruction of the social contract, shared transfer of wealth, life-long learning and world institutions for the environment and peacekeeping, while a more negative mid-range story started to emerge around increased polarisation, the lack of shared myths and identity and decreasing legitimacy of opinion leaders in all sectors. At a number of points in this discussion a participant suggested a possible structure to order the stories that were emerging, but none at this stage received general consent. The process of combining and recombining the story-lines and arguing which made the most sense, and which structures to differentiate the scenarios might be most useful, was complex, fractious, generally good-humoured, frustrating, stimulating and often chaotic. The pivotal moment came when one member suddenly saw a new way in which we might structure the scenarios we had been developing: "It seems to me that the starting point of all these stories is that the information society changes the world. Then there are two dimensions that basically define the scenarios. The first is whether we have had economic growth or not, and the second is whether we have structural change or not. So in the first scenario information technology changes the world, we do have economic growth, and we do make structural adjustments. The result is the scenario built on 'Wired World' and 'New Economy'. In the second scenario information technology changes the world, but we don't get economic growth and there is no structural change and the result is a 'Dark Age' scenario. In the third scenario information technology changes the world, we do get economic growth but we don't get structural change, and the result is a 'Social Fragmentation' scenario, disparity increases, the rich get richer and the poor get poorer. And in the fourth scenario information technology changes the world, but we do make structural changes and the result is a very Canadian form of muddling-through."

Amidst the general agreement that greeted this insight there was a sudden spark of recognition among some members. Some weeks earlier three of us had been reviewing the findings of our first several meetings and trying to determine, through essentially a deductive process, what scenarios it might be possible to derive from that complexity of information. That deductive process had begun by noting that in our discussion of the information economy two polar possibilities had been on the table for the development of the economy over the next decade, either:

- we learn how to use the new technologies to their potential, and embark on a new secular boom, or
- the structural changes in the economy produced by the information age produce persisting unemployment and low or no growth (as conventionally measured).

Similarly our discussion of the social and cultural dimensions defined two polar possibilities, either:

- we manage to find a way to construct a new social consensus, appropriate to the information society, that rebuilds social cohesion and renews the social contract, or
- we face continuing and accelerating social fragmentation and disparities, as the realities of the information age undermine our ability to construct a shared perspective.

These two sets of possibilities, while necessarily over-simplified, had illustrated different ways in which the information society could shape the environment for governance over the next decade, through the changes it might produce in our society and economy. The next step in our deductive process was to try to interrelate these two dimensions. We constructed a matrix with society on one axis and economy on the other, to illustrate the possible environments for governance that might result from interplay of such social and economic changes.

But once we had constructed this matrix we did not know what to do with it, and whether there were viable scenarios that could be devised to fill the various cells. So we had put the matrix aside and did not circulate it. Now, as one of the members presented this structure to the workshop, we all were struck by the degree to which the scenarios, which we had constructed through the inductive process of the last days seemed to fit within the matrix that had been developed deductively earlier. Somehow, the inductive and the deductive routes had led us essentially to the same destination. With this striking realisation, and with the basic structure for differentiating the scenarios now agreed, we broke into four syndicates to develop each scenario further.

DEVELOPING THE STORYLINES

With the general scheme of the scenarios now established the team needs to turn its attention to fleshing out the storylines. The ultimate product